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EXAMINER

ZIMMERMAN, JOHN J

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/991,287

Applicant(s)

STROBEL, RICHARD W.

Examiner

John J. Zimmerman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-12, 14-21, 23-29, 31, 33-35 and 37-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-12, 14-21, 23-29, 31, 33-35 and 37-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

FOURTH OFFICE ACTION

Amendments and Responses

1. The Amendment, Remarks, Exhibit A and Exhibit B received March 15, 2004 have been entered and carefully considered. Claims 1-4, 7-12, 14-21, 23-29, 31, 33-35 and 37-51 are pending in this application.

Interview

2. An interview with Barry Kelmachter (Reg. No. 29,999) and Richard Strobel was held on January 21, 2004. A previous interview had been held with Mr. Kelmachter and Mr. Strobel on June 17, 2003. Brief contents of these interviews are summarized on the interview summary forms included in this application file and also provided to applicant at the time of the interviews.

Claim Rejections - 35 USC § 112, First Paragraph

3. Claims 1-4, 7-12, 14-21, 23-29, 31, 33-35 and 37-51 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

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4. It is not clear from applicant's original disclosure how applicant has determined the claimed hardness data in "GPa" units. Traditionally, hardness values are presented as values represented by standardized hardness scales (e.g. Brinell, Rockwell, Vickers, Knoop, etc. . .) and are obtained by specific hardness tests with specified indenters and loads. No such information is provided by the original disclosure. The applicant's original disclosure does not shed light on how applicant's hardness values were determined and how they came to be presented in "GPa" units. It is not clear from applicant's specification what applicant's hardness values represent.

Claim Rejections - 35 USC § 112, Second Paragraph

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-4, 7-12, 14-21, 23-29, 31, 33-35 and 37-51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. It is not clear how applicant has determined the claimed hardness data in "GPa" units. Typically, traditional hardness values are presented as values represented by standardized hardness scales (e.g. Brinell, Rockwell, Vickers, Knoop, etc. . .) and are obtained by specific hardness tests with specified indenters and loads. No such information is provided in the applicant's original disclosure. The applicant's original disclosure does not shed light on how applicant's hardness values were determined and how they came to be presented in "GPa" units.

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Since it is not clear from applicant's specification what applicant's hardness values in the claims represent, the claims are indefinite. Clarification of this issue is necessary in order to ascertain how to interpret the hardness data in the pending claims.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action.

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 1-3 and 37-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Lupfer (U.S. Patent 3,503,721).

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10. Lupfer discloses hot dipping copper based electrical components in a tin solder containing 2-10% silver (e.g. see column 2, lines 30-50; column 3, lines 2-5). Although Lupfer's preferred embodiment is a tin-silver eutectic having 3.5% silver which melts at 221 °C, the rest of Lupfer's disclosed 2-10% silver range would be expected to melt at higher temperatures since the rest of the range would not be lower melting point eutectic compositions. The melting temperatures of the solder compositions in this range would be inherent to the various tin-silver compositions. As noted in applicant's specification at page 13, the melting point of a 90-10 tin-silver composition is 310 °C (590°F) which easily meets the limitations of the bath temperature in independent claim 39. In addition, barring evidence to the contrary, the hardnesses of the solders would also be inherent to the disclosed tin-silver compositions. Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977).

11. Claims 1-4 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Arai (U.S. Patent 5,902,472).

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12. Arai '472 discloses plating substrates with a tin-silver composition (e.g. see Tables 1, 4, 12, 15, 17, 18). The melting temperatures of the solder compositions in examples would be inherent to the various tin-silver compositions. In addition, barring evidence to the contrary, the hardnesses of the solders would also be inherent to the disclosed tin-silver compositions. Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977). Although it is noted that the claims may specify that the coating is "non-electroplated" and Arai uses electroplating, when there is a substantially similar product, as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show that the same process of making, see *In re Brown*, 173 U.S.P.Q. 685, and *In re Fessmann*, 180 U.S.P.Q. 324. There is no factual evidence of record that coatings produced by all other processes than an electroplating process are physically and patentably distinct from the coatings of Arai. The tin-silver solder coatings are subject to melting (e.g. see solderability tests in the Embodiments) and the melting step would leave tin-silver solder coatings with a final microstructure consistent with melted tin-silver alloy and not a microstructure associated with electroplating. Regarding claim 51, there is no indication that the substrates of Arai are discontinuous.

13. Claims 1-4, 7-12, 14-18, 20-21, 23-28, 31, 33-35 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Arai (U.S. Patent 5,948,235).

14. Arai '235 discloses plating substrates with tin-silver-copper compositions (e.g. see column 4, lines 54-59). The melting temperatures of the compositions in the examples would be inherent to the various tin-silver compositions. In addition, barring evidence to the contrary, the hardnesses of the solders would also be inherent to the disclosed tin-silver compositions. Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977). Although it is noted that the claims may specify that the coating is "non-electroplated" and Arai uses electroplating, when there is a substantially similar product, as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show that the same process of making, see *In re Brown*, 173 U.S.P.Q. 685, and *In re Fessmann*, 180 U.S.P.Q. 324. There is no factual evidence of record that coatings produced by all other processes than an electroplating process are physically and patentably distinct from the coatings of Arai. The tin-silver solder coatings are subject to melting (e.g. see Embodiments

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in column 4) and the melting step would leave tin-silver solder coatings with a final microstructure consistent with melted tin-silver alloy and not a microstructure associated with electroplating. Regarding claim 51, there is no indication that the substrates of Arai are discontinuous.

15. Claims 7-12, 14-18, 20-21, 23-28, 31, 33-35, 37-41, 46-47 and 50-51 are rejected under 35 U.S.C. 102(b) as being anticipated by Harada (Japanese publication 2000-080460).

16. Harada discloses plating substrates with a tin-silver-copper solder composition (e.g. see paragraph [0008]). The silver content can be from 0.5% - 10.0% and the copper content can be from 0.01% - 2.0%. The melting temperatures of the solder compositions in this range would be inherent to the various tin-silver compositions. In addition, barring evidence to the contrary, the hardnesses of the solders would also be inherent to the disclosed tin-silver compositions. Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977). Regarding claim 51, there is no indication that the substrates of Harada are discontinuous.

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Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 1-4, 7-12, 14-21, 23-29, 31, 33-35 and 37-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brinkmann (U.S. Patent 5,075,176) in view of applicant's disclosure of the prior art.

19. Brinkmann discloses hot dipping metal bands for making copper based electrical plug connectors in a tin solder containing between 0.1 to 8.5% silver (e.g. see column 1, lines 45-54; column 2, lines 38-50; Examples 1 and 2; claims 1-4) in a thickness of 0.3-12 μm (\approx 0.00001-0.0005 inches). The examiner notes, however, that Brinkman may teach a Markush group of possible tin alloy systems (e.g. see column 2, lines 42-44), but the Markush is relatively limited and therefore each member combined with tin could be readily envisioned by one of ordinary skill in the art at the time the invention was made. In any event, Brinkman specifically singles out silver containing tin compositions in the examples and teaches endpoints directly in applicant's claimed range (e.g. see range in column 2, lines 40-41, and claim 4). Barring evidence to the contrary, the melting temperatures of the solder compositions in this range would be inherent to the various tin-silver compositions. In addition, barring evidence to the contrary, the hardnesses of the solders would also be inherent to the disclosed tin-silver compositions.

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Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977). Brinkmann clearly teaches that additional constituents such as copper, silicon, antimony, zinc, iron and manganese can be added and teaches that Brinkmann's alloying additions improve the plug properties by affecting the hardness of the coating compositions (e.g. see the discussion in Example 1). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to select the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results, see *In re Aller, et al.*, 105 U.S.P.Q. 233. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 USPQ 549.

20. Regarding claims to specific substrate materials (e.g. claims 19 and 29), applicant's disclosure (e.g. page 7, lines 6-11) shows copper-tellurium to be a typical composition for automobile connectors in the prior art and therefore the use of typical connector substrate

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compositions for the connectors of Brinkmann would have been obvious to one of ordinary skill in the art at the time the invention was made because Brinkmann's invention would be understood to apply to proven connector substrate compositions. It is axiomatic that consideration of the prior art cited by the examiner must, of necessity, include consideration of the admitted state of the art found in applicant's specification, *In re Davis*, 305 F.2d 501, 134 USPQ 256 (CCPA 1962); *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986). Admitted knowledge in the prior art may be used in determining patentability of the claimed subject matter, *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975). Regarding claims specific to batch and/or continuous dipping processes, the reference specifically discloses that dipping processes should be used and selecting batch, semicontinuous or continuous processes to apply the coating is a mere matter of determining which process works more economically for the amount of material to be coated. It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the coating process for scale of the coating operation. A review of the applicant's disclosure shows no patentable distinction in selecting any of these conventional dipping processes and barring evidence to the contrary, using a batch, a semicontinuous or a continuous process is not seen to be a patentable distinction over the teachings of Brinkmann. In addition, optimizing the bath dwell time for the type of hot dipping process (e.g. claim 44) would be within the level of ordinary skill in the art and using lubricants (e.g. claim 45) to facilitate forming of the articles from the hot dipped stock would be understood to be conventional in this field of manufacture.

Response to Arguments

21. Applicant's arguments submitted with the amendments to the claims on March 15, 2004 have been carefully considered but are not persuasive with regards to the remaining rejections.

22. In clarification of the content of the interview of January 21, 2004 (see applicant's description on pages 11-12 of applicant's response), while the examiner noted during the interview that processing conditions and treatments are indeed understood in the art to be able to affect the hardness values of compositions, the examiner also noted during the interview that no such processing conditions and/or treatments were disclosed in applicant's disclosure to be necessary and/or critical to achieving the claimed hardness values. Therefore, the examiner has found no factual evidence of record that the hardness values that would be associated with the prior art compositions would not be inherent to those disclosed prior art compositions and suggested that applicant should provide such evidence if possible.

23. Applicant has submitted a Supplemental Declaration of Richard Stroebel (received March 15, 2004). This supplemental declaration has been carefully considered but is incomplete. On the last page of the declaration, Mr. Stroebel states that "These indentation hardness (sic) are less than the hardnesses measured by MIT using an indentation hardness technique for a 98 wt%% (sic) tin-2 wt% silver coating, for a 95 wt% tin - 5 wt% silver coating, for a 90 wt% tin - 10% silver coating which hardnesses are reported in my pending application and which hardnesses are unexpected and advantageous". While Mr. Stroebel is certainly specific about the equipment, indentation techniques and parameters used to measure the "prior art" sample on page

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2 of his declaration, Mr. Stroebel only states that "an indentation technique" (of unspecified type or parameters) was used to measure his 98 wt% tin - 2 wt% silver coating, 95 wt% tin - 5 wt% silver coating, and 90 wt% tin - 10% silver coating reported in the pending application. It is not clear how much weight can be given to the relatively unsubstantial difference in the hardness value for the sample of 1 wt% silver, 0.03 phosphorous and balance tin described in the Supplemental Declaration when it is not clear whether the measurements of the sample were taken and evaluated in the same manner as those hardnesses described in applicant's specification. [The reason for the use of the term "relatively unsubstantial difference", above, is that the applicant's drawing shows that a gradual increase in hardness would be expected between 1 wt% Ag content and 2 wt% Ag content and thus any difference would not necessarily be attributed to the phosphorous content of the prior art sample and also that applicant had previously described the hardness of his composition to be an "order of magnitude" higher hardness than that of the prior art compositions and the hardness difference alleged in the declaration certainly does not fall into that category.] The examiner notes that it is also clear from the measurements of the sample in the Supplemental Declaration of Mr. Stroebel that the composition of the substrate has a considerable affect on the hardness values of the sample coating. It is not clear what substrate compositions were used when measuring the hardness values described by applicant in the applicant's disclosure and whether the Supplemental Declaration presents a fair comparison of any alleged differences in coating hardnesses or how substantially any differences in hardness values could attributed to the use of different substrate compositions. There appears to be no consistent comparison between the hardness data for applicant's composition and the hardness data for Sn - 1%Ag - 0.03% P. The possibility certainly

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exists and appears quite likely that tests results may have been affected by the use of different substrate compositions and furthermore, until clarified, even the possibility of using of different testing instruments, parameters and evaluation techniques.

24. In any event, it is still not clear how applicant determined the claimed hardness data in "GPa" units in applicant's original disclosure. As noted in previous Office Actions, typically hardness values are presented as values represented by standardized hardness scales (e.g. Brinell, Rockwell, Vickers, Knoop, etc. . .) and are obtained by specific hardness tests with specified indenters and loads. For applicant's benefit, the examiner has included the chapter on hardness testing from the American Society of Metals Handbook (Volume 8, 1995, Mechanical Testing, "Hardness Testing", pages 71-113) to show how hardness values are determined by standard methods in the metallurgical art. The applicant's disclosure does not shed light on how or in what manner applicant's hardness values were determined. It is not clear from applicant's specification what the applicant's hardness values represent. It should be noted that the Supplemental Declaration of Mr. Stroebel (received March 15, 2004) clearly shows that Mr. Stroebel understands that the preparation of the samples, type of indenter, load and averaging of samples are parameters that can be specified when presenting hardness data. As noted above, the declaration even appears to show that the substrate composition affects what hardness values are obtained for the exact same coating compositions. The examiner notes that it is understood by those skilled in the art that the method of measuring hardnesses can be very relevant to the valued obtained and reproducibility of associated hardness data. It is not clear why applicant has not specified any measurement methods or parameters in applicant's disclosure, particularly since

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the applicant's compositions are described in the prior art and therefore the patentable distinction of applicant's coating may hinge on any difference in hardness values from those of the compositions of the prior art. Being that applicant has stated that the prior art has hardnesses that are "an order of magnitude" lower than that of the applicant's invention (see attorney arguments submitted August 25, 2003, page 10, second full paragraph), it would certainly seem appropriate and most prudent to one of ordinary skill in the art to describe how the hardness values were obtained for such a dramatic improvement over the hardnesses of the very same coating compositions describe by the prior art. The articles attached as "Exhibit A" (March 15, 2004) are noted, but the article "The Discovery of a New Ultra Hard Phase Titania" appears to have no relationship to the current application and does not provide any clarification on applicant's measuring methods. The article "Nanoindentation of Tribological Coatings on Steel" appears to simply confirm the examiner's position that information on the indentation technique and parameters is necessary in providing consistent, reproducible and usable hardness data. There, however, is no indication in applicant's disclosure that the techniques of this article were used in obtaining applicant's data, so it is not clear how this article is relevant to the issue of how applicant's own hardness data was obtained. Clarification of this issue is still necessary in order to ascertain how to interpret the hardness data in the specification and claims.

25. Of grave concern to the issue of hardness values presented in this prosecution, the Strobel declaration (of August 25, 2003) shows hardness data which appears to have been produced from ground and polished castings and it now appears that such values would not likely be representative of the hardnesses of coatings. As noted previously in this prosecution and stressed

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to applicant (in the interview of January 21, 2004), the process of coating may affect the segregation and crystal structure of the alloy and hardness measurements from castings of an alloy may not necessarily be representative of the hardness values of the coatings. In view of the fact that the first evidence of how hardnesses were measured were presented by Mr. Stroebel (declaration of August 25, 2003) in the form of hardnesses measured from castings of the alloy, it leaves open the question of whether the values presented by applicant in the disclosure were also measured in this manner. Applicant has presented no evidence or details on how the hardness values in the original disclosure were obtained.

26. While applicant has stated that Lupfer's coatings are an order of magnitude lower in hardness from applicant's coatings, the applicant does not make clear how such a conclusion was reached. The Stroebel declarations do not clear up this issue since no coatings made by Lupfer's process were tested. As noted in the rejection, Lupfer discloses hot dipping copper based electrical components in a tin solder containing 2-10% silver (e.g. see column 2, lines 30-50; column 3, lines 2-5). It is a fairly well grounded assumption in the art that, unless proven otherwise, coatings of the same compositions made the same processes will have the same properties. Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain

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and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977). Applicant has not fulfilled applicant's burden on this issue.

27. The Strobel declaration (August 25, 2003) also states that "articles which are dip soldered using Lupfer's molten solder bath are dip soldered below 221 degrees Centigrade". It is not clear how this information is relevant since this temperature refers to the bath temperature of a second solder composition (e.g. lead-tin solders which are kept below the melting temperature of the tin-silver alloy so as not to remelt the tin-silver alloy; e.g. see column 3, lines 14-33) and has no bearing on the actual bath temperatures used for initially applying the tin-silver alloys of Lupfer. In view of the fact that Lupfer uses tin containing 2-10% Ag, it is assumed that the bath temperatures used to apply these alloys must be at least their melting points. While it is clear that Lupfer prefers the tin-silver eutectic that melts at 221 °C, he clearly states that the use of up to 10% silver content is considered part of his invention. The melting point of an alloy is related to the composition of the alloy and as noted in applicant's specification on page 13, lines 19-22, the melting point of 95-5 tin-silver coating is in the range of 245-253 °C and the melting point of 90-10 tin-silver coating is 310 °C (590°F).

28. Applicant argues that the rejections of the claims under 35 U.S.C. 102(b) as being anticipated by Arai (U.S. Patent 5,902,472) or Arai (U.S. Patent 5,948,235) should be removed because the claims specify that the coating is "non-electroplated" and these references use electroplating. The examiner notes, however, that when there is a substantially similar product, as in the applied prior art, the burden of proof is shifted to the applicant to establish that their

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product is patentably distinct not the examiner to show that the same process of making, see *In re Brown*, 173 U.S.P.Q. 685, and *In re Fessmann*, 180 U.S.P.Q. 324. There is no factual evidence of record that coatings produced by all other processes than electroplating processes are physically and patentably distinct from the coatings of the Arai references. In any event, the coatings of Arai are solder coatings and are subjected to melting after being plated on substrates. The tin-silver solder coatings are subject to melting (e.g. see solderability tests in the Embodiments) and the melting step would leave tin-silver solder coatings with a final microstructure consistent with melted tin-silver alloy and not a microstructure associated with electroplating. In addition, there is no factual evidence of record that the electroplating baths of Arai would leave any residues inconsistent with coatings produced by non-electroplating processes.

29. Regarding the rejection of the claims over Brinkmann (U.S. Patent 5,075,176), applicant continues to argue that Brinkmann teaches a laundry list of possible candidates and does not teach a tin-silver binary system. The examiner notes, however, that Brinkman may teach a Markush group of possible systems, but the Markush is relatively limited and therefore each member combined with tin could be readily envisioned by one of ordinary skill in the art at the time the invention was made. In any event, Brinkman specifically singles out silver containing tin compositions in the examples and teaches endpoints directly in applicant's claimed range (e.g. see Example 1 and claim 4). For instance, in Example 1, a tin composition containing 1% silver and a small amount of phosphorus (three tenths of a percent) is disclosed. It is noted that since there is no indication in Brinkmann's "Detailed Description" that phosphorus has a function in the coating or is considered an additive for any reason, one of ordinary skill in the art

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would be lead to believe that the phosphorus in the example may simply be an impurity in the bath or at most may be an additive that is clearly not necessary to the tin-silver bath composition of Brinkmann and therefore may be omitted. In any event, Brinkmann is not limited to the embodiments presented in his examples. It is quite clear that one of ordinary skill in the art at the time the invention was made would envision a tin alloy coating containing between 0.1 and 8.5 wt.% silver from the alloy described in column 2, lines 38-50, of Brinkmann.

30. Regarding applicant's previous arguments on the IACS values of tin-silver and tin-silver-phosphorus, no data for the IACS value of tin-silver alloy commensurate with the scope of the independent claims has been provided. It is of interest, however, that applicant's specification describes an IACS of 15.6% to be "excellent" (e.g. see page 12, lines 13-14) and this is essentially the same conductivity of Brinkmann's example (e.g. see 15.5% IACS given in the Strobel declaration of August 25, 2003).

Conclusion


31. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

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advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

33. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John J. Zimmerman
Primary Examiner
Art Unit 1775

jjz
June 11, 2004